UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,610	11/10/2003	Roger W. Phillips	48930-01611	4705

27975 7590 11/30/2004

ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST P.A.
1401 CITRUS CENTER 255 SOUTH ORANGE AVENUE
P.O. BOX 3791
ORLANDO, FL 32802-3791

EXAMINER	
CHANG, AUDREY Y	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/705,610	PHILLIPS ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's amendment filed on September 7, 2004, which has been entered into the file.
- By this amendment, the applicant has amended claim 1. The applicant is respectfully noted that claim 13 has been "amended" with *underlined phrase* yet it does not appear to be amended in actual text. It is not clear what is the status of the claim. Claim 13 is being treated as not-amended claim.
- Claims 1-36 remain pending in this application.
- The rejections to claims 1-12, 14-15 and 26-27 under 35 USC 112, second paragraph, set forth in the previous Office Action are *withdrawn* in response to the applicant's amendment.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 5, 7-12, 13-15, 18, 20-24, 25-27, 30 and 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Uyama et al (PN. 5,700,550).

Uyama et al teaches a *transparent hologram seal* that can be applied as a *security article*, wherein the hologram seal comprises a *transparent base layer* (2, Figure 1) serves as the transmissive *substrate* having a first and a second surface, *a hologram forming layer* (4) having *hologram*, which essentially is an *interference pattern*, recorded therein forming on one of the surface of the base or substrate and a *multilayered evaporation coating layer* (10). The evaporation coating layer (10) is

comprised of *alternatively arranged high and low refractive index layers* such that it *changes color* as light either transmits or reflects through the layer when the viewing angle is changed. This multilayered evaporation layer serves as the *color shifting multilayer optical coating*, (please see Figure 1, columns 5-6).

This reference has met all the limitations of the claims with the exception that it teaches that the hologram layer is formed on a first surface of the base layer and the color shifting coating layer is formed on the hologram layer but it does not teach explicitly that the color shifting coating layer is formed on the second surface of the substrate that *opposites* to the first surface, (where hologram layer is formed). However the position of the color shifting coating layer with respect to the base layer **does not change** or **affect** the color shifting property of the layer. In particularly, Uyama et al teaches explicitly that the *color shifting coating layer* will behave the *same*, namely changes the color of appearance for either transmitted or reflected light ray when the viewing angle is changed, (please see column 6, lines 25-29). To place the color shifting coating layer at substrate surface opposite to the hologram-forming layer or to place it at the same side and on the hologram forming layer will not affect the color shifting function of the coating layer to the hologram seal. Such modification would therefore have been obvious matters of design choices to one skilled in the art since it really functions the same. Uyama et al further does teach that typically a hologram layer is of polymer material with low refractive index, (please see column 6, lines 21-24). One skilled in the art then, besides the design choices, would be motivated to separate the hologram forming layer from the multilayered color shifting layer by a substrate to avoid **any possible** interference between the hologram layer and the color shifting layer and therefore avoid possible noise.

With regard to the feature concerning the *dimensions* of the microstructures of the hologram pattern, (with regard to claims 1-2, 14-15, and 26-27), this reference does not teach explicitly about the dimension of the interference fringes or microstructures. However this feature must be *inherently* met by the hologram disclosed since in order for the hologram or the interference fringes to allow incident light

interferes to each other, the fringe size must be compatible to the wavelength of the incident light, that is to say the fringe size must be multiple of the wavelength. Uyama teaches that the hologram may be operated in visible light range (i.e. wavelength ranges 400 nm to 700 nm or 0.4 microns to 0.7 microns). This means the fringe size must be multiple of such which therefore certainly include the size in the range between 0.1 to 1 microns or 0.1 to 10 microns.

With regard to claims 5, 18 and 30, Uyama et al teaches that the color shifting layer (10) has multilayered structure with alternative arranged high-refractive index *dielectric* layers (6) and low-refractive index *dielectric* layers (8), (please see column 5, lines 62-67).

With regard to claims 7, 13 and 32, Uyama et al teaches that the hologram seal may further include a *print layer* (28) with desired character, numerical or pattern printed into the hologram seal, (please see columns 17-18). This reference teaches that the print layer (28) may be formed by *conventionally known printing method* or coating method such as gravure printing method, (i.e. some kind of etching method). Although it does not teach explicitly that laser ablation method is used, however since laser ablation is conventionally known laser etching method, this product-by-process limitation therefore *does not* differentiate the printed image, (i.e. the final product) from the prior art print layer. It would have been obvious to one skilled in the art to use conventional laser ablation method as the means to print the characters or pattern into the hologram seal to add additional information to the seal, since laser ablation method is commonly available. Although this reference does not teach explicitly that the print layer is in the color shifting coating however the location of the print layer does not affect the function of this print layer, namely to add additional information to the hologram seal, such modification is considered to be obvious matters of design choice to one skilled in the art. (Please see MPEP 2173.05(p) for product-by-process limitations).

With regard to claims 8, 10, 20, 22, 25, and 34, Uyama et al teaches to use *adhesive layer* (16) to adhere the hologram seal to intended object (20), (Figures 1, 10 and 9B), but it does not teach explicitly to

use an adhesive layer to adhere the color shifting layer to the substrate. However using adhesive layer to increase the adhesion of the layer to another layer is rather well known practice in the art such modification would have been obvious to one skilled in the art.

With regard to claims 9, 21, and 33, Uyama et al teaches that the hologram seal may be applied as security article for proving authenticity of an article however it does not teach explicitly that the hologram seal is of a thread form. However it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham, 2 USPQ2d 1647 (1987).

With regard to claims 11-12, 23-24 and 35-36, Uyama et al teaches that the hologram or the interference pattern may either be formed in a hologram forming layer (4) and secured to the transmissive substrate (i.e. base layer) or the hologram can be formed on the substrate by making the hologram forming layer and the substrate-base layer a single layer, (please see column 5, lines 59-61).

3. Claims 3-4, 16-17 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Uyama et al as applied to claims 1, 13 and 25 above, and further in view of the patent issued to Coombs et al (PN. 5,214,530).

The hologram seal having hologram forming layer and color shifting coating layer taught by **Uyama** et al as described for claims 1, 13 and 25 above has met all the limitations of the claims. This reference teaches that the color shifting coating layer is a multilayer interference filter with alternatively arranged high and low refractive index layers but it does not teach explicitly that it can also assume the structure of having either absorber layer, dielectric layer and reflector layer or having absorber layer, dielectric layer and absorber layer. **Coombs** et al in the same field of endeavor teaches an optically variable interference device (29) that includes absorber layer formed on a substrate, a dielectric layer overlaying the absorber and a reflector layer overlaying the dielectric layer and it also includes an

absorber layer formed on the substrate, a dielectric layer overlaying the absorber layer and an absorber layer overlaying the dielectric layer, (please see Figures 1 and 9). It would then have been obvious to one skilled in the art to apply the teachings of **Coombs** et al to modify the interference color shifting coating layer of Uyama et al to make it to with different designs for the benefit of providing different transmission/reflection properties for the coating layer.

4. Claims 6, 19, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Uyama et al as applied to claims 1, 13 and 25 above, and further in view of the patent issued to Phillips et al (PN. 5,424,119).

The hologram seal having hologram forming layer and color shifting coating layer taught by **Uyama** et al as described for claims 1, 13 and 25 above has met all the limitations of the claims. This reference teaches that the color shifting coating layer is a multilayer interference filter with alternatively arranged high and low refractive index layers but it does not teach explicitly that it can also assume the structure of having a plurality of multilayer interference thin film flaks dispersed in a polymeric material. **Phillips** et al in the same field of endeavor teaches an interference filter that is comprised of a plurality of multilayer interference thin film flaks dispersed in a polymeric layer, (please see Figure 5, and the abstract). It would have been obvious to one skilled in the art to apply the teachings of Phillips et al to modify the interference color shifting coating layer of Uyama et al to make it with dispersed multilayer interference filter flakes for the benefit of providing different color effect for the hologram seal.

Terminal Disclaimer

5. The terminal disclaimer filed on September 7, 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of **US patent 6,761,959,**

Patent applications 10/706,142 and 10/688,357 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

6. Applicant's arguments filed September 7, 2004 have been fully considered but they are not persuasive.

7. In response to applicant's arguments, which state that the applicant does not understand why the *position* of the color shifting coating *with respect to the base layer* does not change the affect of the color shift property, the examiner wishes to respectfully ask the applicant to check with any standard textbook concerning the property of the interference type of color shifting coating. The examiner also wishes to explain such briefly. The color shifting coating disclosed by the cited Uyama reference is comprised of *alternatively arranged high refractive index and low refractive index layer*, which known in the art as *interference filter*. The incident light enters the coating will be *partially reflected* and *partially transmitted* at *each* interfaces between the high/low refractive index layers. All of the reflected light or all of the transmitted light will interfere with each other, respectively, to create reflected and/or transmitted light of particular spectra. The color shifting property of the coating is explained by Uyama in column 6, lines 25-29. The multiple reflections and transmissions of the light at each interface is the essential factors for the interference filter to operate and it is the reason why the cited Uyama reference *teaches* that the color shifting property of the color shifting coating will be observed for light either *transmits through* or *reflect through the coating*, (pleas see column 6, lines 1-11, and 25-34). It is implicitly true that the transparent substrate plays NO PART in the multiple reflections and transmissions of the light at the interfaces of the layers in the coating, therefore it is implicitly true the *position* of the color shifting coating *respect* to the substrate WILL NOT AFFECT the color shifting property of the coating. The applicant is also respectfully noted that the light path for the instant application is: incident

light → interference pattern → substrate → color shifting coating. The light path for the cited Uyama reference is: incident light → substrate → interference pattern → color shifting coating. Unless the *substrate* has a particular optical property that is not being disclosed or claimed, the incident light will undergo *diffraction* (by interference pattern) and *color shifting* (by color shifting coating*) functions* **in the same order in both cases**. By the theory of diffraction and the interference coating, the security article of the instant application and the cited Uyama reference essentially have to function the same.

8. In response to applicant's arguments concerning the "significant and unexpected advantage" (as recited in the remark of page 15, paragraph 4), by having a separation between the interference pattern and the color shifting coating, would "ensures a that the color of the hologram will be "true" and not a result of the *significant interference* between the hologram of microstructural interference pattern with the color shifting coating" is completely wrong. It is implicitly true that the hologram is a result of the *interference* among the light effected by the *interference pattern, and it is solely determined by the stored interference pattern.* The color shifting layer will not cause **any** *significant interference* to effect the play back of the hologram or interference pattern. Since the fundamental reason for it is because they simply operates based on different theory and principle. It is true that the light strikes the interface of the hologram layer and the color coating layer (or the **substrate layer** for the same reason) will undergoes partial reflection and partial transmission, these partially reflected or transmitted light will not be able to effect the diffraction of light by the interference pattern to effect the creation of the hologram, since they are negligibly small. These light may be interfering with other partially reflected and transmitted light from other interfaces within the *color shifting coating.* If the interference is constructive then they will contribute to the color shifting effect but if the interference is destructively then they will contribute no noticeable effect. However the color shifting property is dominant by the layer structure of the color shifting coating. One can therefore conclude that there is no ***significant interference*** between the

interference pattern and the color shifting pattern to effect the hologram creation, if there is, then the substrate layer will also give the same effect. Furthermore, it is apparent that the applicant DOES NOT come across such "significant and unexpected advantage" of introducing the separation substrate layer since if it is the case, then the applicant WILL NOT disclose in different embodiments to have the diffraction interference pattern (104) placed **right next** to the color shifting coating layer as shown in Figures 8A, 9 and 14. The cited Uyama reference therefore reads on the claims of the instant application.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.